

**Response to Information Requested by MDEQ in the March 13, 2012 Letter
to the Marquette County Road Commission**

April 12, 2012

1.0 Introduction

In its letter dated March 13, 2012, the Michigan Department of Environmental Quality (MDEQ) provided comments to the application for permit (AFP) for the proposed CR 595 project and requested additional detail to more adequately explain the conclusions drawn by the applicant Marquette County Road Commission (MCRC). MDEQ indicated that the Project Purpose for CR 595 is “appropriately defined” in the AFP. The project purpose as defined in the AFP is as follows:

The purpose of the proposed CR 595 project is to construct a primary county north-south road that (1) connects and improves emergency, commercial and recreational access to a somewhat isolated but key industrial, commercial and recreational area in northwest Marquette County to US-41, and (2) reduces truck travel from this area through the County’s population centers.

MDEQ requested a number of items to “clarify and amplify” the information discussing the three alternatives to CR 595. The three alternatives needing further “clarification and amplification” are Mulligan Plains West, Mulligan Plains East, and CR 510-Red Road-Sleepy Hollow (Figure 1). The information requested by MDEQ in the March 13, 2012 letter is underlined in this response.

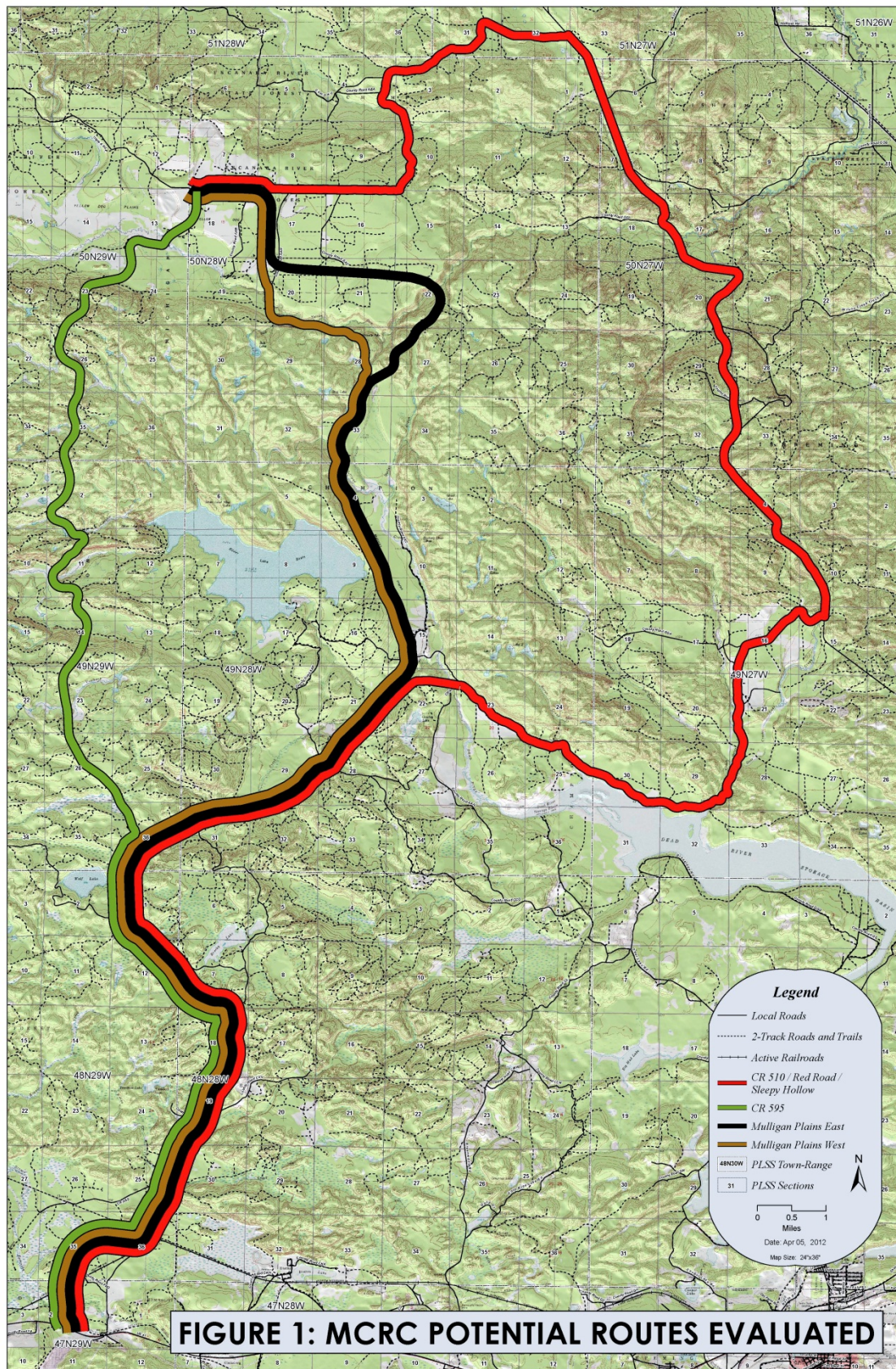
The Mulligan Plains West and East routes have been revised from that shown in the AFP documents in that portion of the route from the Dead River southwesterly to the Wolf Lake area to create a more direct route. The plan and profile drawings for these two revised alternatives and for the CR 510/Red Road/Sleepy Hollow alternative are provided on a CD in Appendix A.

INFORMATION REQUESTED FOR REVIEW UNDER PART 303

2.0 Mulligan Plains West and Mulligan Plains East Alternatives

The primary issues associated with the Mulligan Plains West alternative as identified by the applicant are:

- the existence of a Nature Conservancy Conservation Easement on lands in Sections 21, 28, and 29, T-50N-R28W;
- the proposed route is located in close proximity to the Yellow Dog River for a distance of about one mile;
- the Dead River crossing on this route is downstream of the Silver Lake Basin.



The applicant's concerns associated with the Mulligan Plains East alternative are:

- the necessity of crossing of the deep gorge at the Yellow Dog River;
- crossing of the Dead River on this route is located downstream of the Silver Lake Basin.

The Mulligan Plains East alternative for the Yellow Dog River crossing was evaluated using two designs; a "high bridge" about 240 feet above the river and a "low bridge" that would be about 100 feet above the river. The construction cost estimates are provided for both of these routes and bridge designs (Appendix B). The "low bridge" design was determined to be not prudent due to extraordinary cost. The estimated construction cost for the Mulligan Plains East route with the "low bridge" design (which includes construction of approaches) is \$212 million. This high cost is attributed to an extensive amount of rock cut and soil excavation necessary to establish lower vertical grades to cross the river with this type of bridge. This alternative raises significant concerns with the control of soil erosion and stormwater runoff into the Yellow Dog River from the large earth cuts necessary to construct the bridge approaches. The feasibility of this route and bridge design is questionable as well.

The cost of the Mulligan Plains East route with the "high bridge" design is \$126 million, some \$86 million less than the route with the low bridge, that cost is also extraordinary, particularly when compared to the projected cost of CR 595, which is approximately \$82 million.

MDEQ requested the following additional information for the Mulligan Plains West and Mulligan Plains East alternatives:

- 2.1. Indicate and describe the method used to estimate wetland impacts for each of these alternatives.

Response:

Mulligan Plains East

Field investigations of the Mulligan Plains East route were conducted on July 15 and 16, 2010 and November 29 and 30, 2010. Teams of biologists investigated the proposed road route. The proposed route centerline was located in the field using a global positioning system (GPS) unit. After making visual observations of plant community characteristics and evidence of wetland hydrology, approximate wetland boundaries were located by those biologists within a 200-foot wide corridor (i.e., approximately 100+ feet on each side of the route centerline). Soil borings were not conducted during the evaluation. Each identified wetland boundary was digitally mapped using sub-meter accuracy GPS. All GPS data were downloaded in the office and mapping was reviewed by field biologists. Although not all aspects of the Army Corps of Engineers (USACE) wetland delineation methodology were used during the field evaluation of the Mulligan Plains East alternative, the wetland boundaries depicted and used to estimate impacts

are a relatively accurate approximation of the wetland boundaries and impact areas within the preliminary road alignment.

Mulligan Plains West

More specific wetland identification procedures for the Mulligan Plains West alternative were conducted in accordance with the *USACE Wetland Delineation Manual* (USACE 1987) and by applying the procedures and standards established in the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (USACE 2009). After preparing a preliminary road alignment, teams of biologists conducted field investigations on September 12-16, 2011. The proposed route centerline was located in the field using GPS. Wetland boundaries were delineated within an approximately 200-foot wide corridor (i.e., approximately 100+ feet on each side of the route centerline).

In accordance with the USACE Manual, when an area of wetland was identified, nested vegetation sample plots and soil sample sites were established on both sides of a wetland/upland boundary to gather requisite data on plants, soils, and hydrology. Wetland data forms were completed according to the requirements of the wetland delineation methodology. Each identified wetland boundary was digitally mapped using GPS equipment with sub-meter accuracy capability. Wetland boundaries on this alternative were *not* demarcated with flags or ribbons along the proposed route. However, all GPS data were then downloaded in the office and reviewed by field biologists. Wetland delineation maps were prepared depicting the location of the wetlands within the proposed road corridor. Wetland delineation maps were created using 2005-2006 aerial imagery as a base layer, with the GPS-surveyed wetlands shown along the location of the proposed road route on that base layer.

MiRAM for Mulligan Plains West

In addition to the wetland delineation conducted within the Mulligan Plains West corridor, each of the 13 identified wetlands was evaluated using the Michigan Rapid Assessment Method for Wetlands (MiRAM). Of the 13 MiRAM wetland evaluation areas that were rated, eight scored in the “high functional value” range, four scored in the “moderate functional value” range and one scored in the “low functional value” range.

- 2.2. Provide a comparison of the cumulative impacts to aquatic resources that would result from the construction of each of these alternatives to the cumulative aquatic resource impacts that would result from the proposed CR 595 construction.

Response:

Seven potential cumulative impacts to aquatic resources that may result from the construction and operation of the proposed CR 595 or the alternative route Mulligan Plains West have been identified (Table 2-1). Best Management Practices and mitigating measures have been (or will be) integrated into the project design and will be implemented during construction and operation of CR 595 to minimize these cumulative impacts to the extent practicable. Until the project is completed, the extent of any cumulative impacts will not be known for a certainty.

Table 2-1. Comparison of Potential Cumulative Impacts to Aquatic Resources from the Implementation of CR 595, Mulligan Plains West or East Alternatives.

Potential Cumulative Impact	CR 595	Mulligan Plains West	Mulligan Plains East
Secondary development	<p>Secondary development that may result from the construction of CR 595 is not expected to have any substantial effect on aquatic resources (i.e. wetlands or streams). Any secondary development that would affect aquatic resources would likely require a permit from MDEQ. Activities not requiring an MDEQ permit, such as construction of logging roads, are not expected to increase as a result of CR 595. Logging of timber lands is dependent upon the timing of a timber compartment coming up for harvest due to timber growth and economic factors, not on road access.</p> <p>A substantial percentage of the route is through large timber company holdings that have been owned and dedicated to timber production for over 100 years. There is little virgin timber on these lands; timber on most lands has been harvested more than once in past years. Roads and trails already exist on these lands. Most timber lands are in Commercial Forest Act (CFA) devoting the use of the land to timber production. The CFA provides public access. There is no electric power north of Brocky Lake, which limits the size of any development to small camps; these small camps are relatively unobtrusive.</p>	<p>Secondary development that may result from the construction of the Mulligan Plains West route is not expected to have any substantial effect on aquatic resources (i.e. wetlands or streams).</p> <p>Generally the same situation as CR 595 in regard to the land ownership pattern, with the significant exception that a Conservation Easement held by The Nature Conservancy absolutely restricts the development of four sections of land adjacent to this alternative route. Electric power is not available on this entire route north of Brocky Lake; this lack of power limits the size of any development to small camps; these small camps are relatively unobtrusive.</p>	<p>Secondary development that may result from the construction of the Mulligan Plains East route is not expected to have any substantial effect on aquatic resources (i.e. wetlands or streams). The land ownership patterns (i.e. generally ownership is in large acreage) and the lack of electric power would also limit size of any development to small camps; these small camps are relatively unobtrusive</p>

Table 2-1 (continued).

Potential Cumulative Impact	CR 595	Mulligan Plains West	Mulligan Plains East
Wildlife mortality	<p>Mortality to wildlife species associated with aquatic resources is likely with any road that crosses wetlands and streams, but the magnitude of impacts to wildlife directly associated with aquatic resources is not likely to be substantial. This could include wildlife using a wetland as a travel corridor or species that are dependent upon living in an aquatic environment. This issue has been addressed in the AFP. The average vehicle speeds on this route are expected to be 45 mph or less. Signage and other measures to reduce wildlife mortality on the roadway may be implemented if found to be necessary.</p>	<p>Wildlife mortality is likely to be similar on the Mulligan Plains West route as on the CR 595 route from the perspective of both routes traverse generally similar terrain and habitats and both routes are similar in total length. However, the Mulligan Plains West route crosses fewer wetlands and streams, thereby reducing potential interaction with wildlife species associated with aquatic resources.</p>	<p>Wildlife mortality is likely to be similar on the Mulligan Plains East route as on the CR 595 route from the perspective of both routes traverse generally similar terrain and habitats and both routes are similar in total length. However, the Mulligan Plains East route crosses fewer wetlands and streams, thereby reducing potential interaction with wildlife species associated with aquatic resources.</p>
Introduction of non-native species of vegetation	<p>Introduction of non-native species of vegetation into a landscape that is dominated by native plant species is a potential cumulative effect of a new road. The vectors for new plant species to be introduced would primarily be by seeds or propagules in soil imported from another area or carried by vehicles and deposited along the roadway. Measures will be implemented to minimize these potential vectors and to monitor plant communities along the roadway, as described in the AFP, but the potential will exist for introduction of non-native plant species that may affect aquatic resources.</p>	<p>The same potential for introduction of non-native species exists for the Mulligan Plains West route as with CR 595, except the Mulligan route crosses fewer wetlands and streams and the opportunity for introduction of non-native species is reduced proportionally compared to CR 595.</p>	<p>The same potential for introduction of non-native species exists for the Mulligan Plains East route as with CR 595, except the Mulligan route crosses fewer wetlands and streams and the opportunity for introduction of non-native species is reduced proportionally compared to CR 595.</p>

Table 2-1 (continued).

Potential Cumulative Impact	CR 595	Mulligan Plains West	Mulligan Plains East
Road runoff affecting water quality	<p>Cumulative effects of road runoff on aquatic resources would most likely be manifested in stream water quality. As such, the number of stream crossings would increase the opportunity for potential negative effects proportionally. Implementation of BMPs for stormwater runoff management was a diligent consideration in the design of CR 595, with the intent of minimizing the opportunity for cumulative impacts from runoff entering streams. Measures will be implemented to attempt to minimize impacts from runoff, such as special trucks to transport ore and proper maintenance of the roadway,.</p> <p>Runoff into streams from the existing unpaved roads and trails along portions of the proposed CR 595 route is a current detriment to stream water quality due to sedimentation. CR 595 will be paved with stormwater runoff controls integrated into the road design to minimize the direct introduction of runoff into streams and wetlands. Paving will serve to reduce the effects of runoff entering streams.</p> <p>CR 595 would involve the replacement of 14 undersized or misplaced culverts, thereby improving stream water quality by reduction of sediment loading and stream scour.</p> <p>Another purposeful design factor is the maintenance of existing runoff patterns on the landscape to ensure that wetland hydrology is not altered. Road runoff should have little sediment load by the time it reaches any wetland or stream due to the stormwater control measures implemented, such as riprap outfalls, stable slopes, and not combining flow from large areas that could cause erosive flow velocities.</p>	<p>The Mulligan Plains West route has been designed with similar attention to minimizing any cumulative impacts from road runoff that could affect aquatic resources. However, this route has fewer stream crossings and would therefore have proportionally less potential for road runoff affecting aquatic resources.</p> <p>There is concern for runoff from the portion of this route that parallels the Yellow Dog River for about one mile having an effect on the river. Runoff would be directly down a steep slope to the river and control of stormwater runoff may be problematic.</p>	<p>Road runoff potentially affecting water quality in the Yellow Dog River is a concern with the Mulligan Plains East route. The proposed crossing of the deep gorge could result in road runoff entering the river from the bridge, possibly impacting water quality.</p>

Table 2-1 (continued).

Potential Cumulative Impact	CR 595	Mulligan Plains West	Mulligan Plains East
Air quality	<p>Air quality may be impacted to some extent by the vehicles using CR 595 in the form of engine emissions. The potential for greenhouse gas emissions has been discussed in the AFP in some detail. Deposition of hydrocarbons and other compounds on and adjacent to the roadway from emissions could have deleterious effects on stream water quality. Although there will be a net increase in air emissions after CR 595 is operational compared to present conditions, there is no reason to believe that air quality will have any measurable effect on aquatic resources.</p>	<p>The Mulligan Plains West route is 24 miles in length, which is 2.6 miles longer than the CR 595 route, thus has the potential for adding more emissions to the environment. This route has fewer wetland and stream crossings, thereby less opportunity to impact aquatic resources with air emissions.</p>	<p>The Mulligan Plains East route is 26.4 miles in length, which is 5 miles longer than CR 595 and 2.4 miles longer than Mulligan Plains West. The potential cumulative impacts on air quality that could affect aquatic resources would be comparable to CR 595 and Mulligan Plains West, taking into consideration the length of the routes and the reduced wetland impacts and stream crossings on the Mulligan Plains East route.</p>
Increased noise from vehicles	<p>Noise levels from vehicles have been addressed in the application for permit and specific site studies were done to gather noise data. If CR 595 is constructed, there is no doubt that noise levels will increase over existing noise levels resulting from increased vehicle use. Camp owners or some recreationists (e.g. hikers, cyclists, or gatherers) may be affected by vehicle noise from CR 595; ATV or snowmobile users are not as likely to be affected by increased noise attributed to CR 595.</p>	<p>Noise resulting from vehicles on the Mulligan Plains West route is not likely to be substantially different than noise on the CR 595 route. Disturbance to some species of wildlife associated with aquatic resources may result from road noise. The south portion of both routes is the same and could affect camp owners and some recreationists there, mostly south of the Wolf Lake area. Noise from vehicles on other portions of the Mulligan Plains West route could potentially affect people, especially in the vicinity of the Yellow Dog River where the proposed road is in close proximity to the river for a distance of about one mile.</p>	<p>Similar to the Mulligan Plains West route in regard to disturbance to wildlife species associated with aquatic resources, but disturbance to recreationists on the Yellow Dog River near Pinnacle Falls may be affected by vehicle noise. The high bridge may transmit vehicle noise for some distance in this relatively remote area.</p>

Table 2-1 (continued).

Potential Cumulative Impact	CR 595	Mulligan Plains West	Mulligan Plains East
Improved access for recreation	<p>The proposed CR 595 will improve access to portions of Marquette County and therefore provide better opportunities for more people to access thousands of acres of lands open to public use, mostly timber company lands enrolled in the Commercial Forest Act. This cumulative impact of CR 595 may be a positive impact, but some may purport that more people access is a negative impact to aquatic resources. More people recreating in/near wetlands and streams may have negative effects on aquatic resources. Presently most hunters and fishermen access wetlands/streams with ATVs, so better road access is not likely to have substantial effect on access for that form of recreation. Overall, negative impacts to aquatic resources due to improved recreation access should be minimal.</p>	<p>Improved access for recreationists on the proposed Mulligan Plains West route is not as important due to the fact that existing county roads (mostly unimproved) provide access to most of the land area served by this route. An all-season paved road would allow year-round access, but snowmobiles presently allow access to remote areas in winter anyway. Some may view the presence of a paved county road through this area as a negative impact on aquatic resources, especially in the Yellow Dog River area. Overall, negative impacts to aquatic resources resulting from improved recreation access should be minimal.</p>	<p>Similar to the Mulligan Plains West route.</p>

Table 2-1 (continued).

Potential Cumulative Impact	CR 595	Mulligan Plains West	Mulligan Plains East
Future mining development	<p>The implementation of future mining development in northern Marquette County is not primarily dependent upon the presence of CR 595 or any other road access. If additional mineral resources are discovered in this region and they can be extracted and processed in an economic fashion, then mining will likely commence. In other words, CR 595 will not cause more mining to ensue. If mining is proposed in other areas of Marquette County then the presence of CR 595 could result in more economic benefit from the mine by minimizing the need for additional access roads. The cumulative impacts of CR 595 would likely be beneficial in this instance because the access provided by CR 595 to northern Marquette County would likely not have to be duplicated. Upgrades to other existing roads, or construction of new road segments or mining roads, may result from other mining development, but these activities would be necessary to provide mine access regardless of the presence of CR 595.</p> <p>The potential exists for future east-west county roads in northern Marquette County to connect public roads in Baraga County to Marquette County. The cumulative impacts of future roads on aquatic resources are highly speculative and would be controlled by MDEQ permits.</p>	<p>The cumulative impacts of mining development on aquatic resources that may result from the implementation of the Mulligan Plains West alternative would be similar to the explanation provided for CR 595.</p>	<p>The cumulative impacts of mining development on aquatic resources that may result from the implementation of the Mulligan Plains East alternative would be similar to the explanation provided for CR 595.</p>

In summary, the cumulative impacts on aquatic resources that may result from the proposed CR 595 project, or the implementation of either of the Mulligan Plains alternatives discussed in this response, are not expected to be significant. The primary reasons for this conclusion are the land ownership patterns, the dedicated uses of the lands contiguous to the proposed CR 595, and the lack of electric power in this area.

Land ownership, which is largely in corporate timber company ownership, is dedicated to timber production and not for development. Existing development is mostly small camps primarily located on small tracts of land leased from the timber companies. The expense of providing efficient electric power by any utility company will continue to be a limiting factor for more intense developments in this portion of Marquette County. Lands owned by mining companies are also unlikely to be sold for development.

2.3. Provide a cost comparison for each of the alternatives to proposed CR 595, including:

- i. Information regarding cost and logistical reasons to document why crossing the Conservation Easement is not considered to be feasible and prudent, in consideration of potential mitigating measures that could be put in place. You may wish to consider requesting determination of whether a Threatened and Endangered species permit is required by DNR for the specific route shown in the application, affecting sections 20 and 28 of the conservation easement area.

Response:

As a prelude to addressing the questions posed by MDEQ above, it is important to note that additional legal research regarding the feasibility of modifying the Conservation Easement has been conducted by legal counsel. This research has led to the conclusion that the language of the Conservation Easement itself and case law relating to modification of Conservation Easements would seem to preclude modification of the easement, even if the landowner and The Nature Conservancy were willing (Appendix C). In addition, The Nature Conservancy has indicated that it is not willing to pursue any modification of the Conservation Easement in its letter to the Marquette County Road Commission dated January 5, 2012 (Appendix C). Because of the public interest in conservation easements, any change is potentially vulnerable to a third party legal challenge and courts are typically not willing to modify or vacate them.

The availability of eminent domain (i.e. condemnation) by MCRC is not seen as a measure to compel the implementation of the Mulligan Plains West route through the Conservation Easement, thereby making it a feasible and prudent alternative. MCRC is opposed to using the power of eminent domain to acquire properties that have a special public value and are subject to a conservation easement for their preservation. MCRC considers the forced acquisition of such properties as not in the public interest and also believes that condemnation of the Conservation Easement for CR 595 is neither reasonable nor prudent.

For the foregoing reasons the applicant concludes that this alternative is not available. However, there is information presented in section 2.3 iv and 3 iii of

this response that address the cost, logistics, and mitigation associated with the Mulligan Plains West route.

In regard to the MDEQ comment about listed species, as part of the evaluation for the Mulligan Plains East and Mulligan Plains West routes a search of the Michigan Natural Features Inventory (MNFI) database was conducted. A search was conducted in July 2011 and was refreshed on March 23, 2012. Sections 20 and 28 were included in this database search (note: Section 20 is not in the Conservation Easement). The results of the March 23, 2012 MNFI database query are provided in Appendix D.

Two state-threatened plants; dwarf bilberry (*Vaccinium cespitosum*) and narrow-leafed gentian (*Gentiana linearis*); and one Federal- and State-Endangered bird; Kirtland's warbler (*Dendroica kirtlandii*) are listed for the area. Two Special Habitats (Mulligan Cliffs and Rocking Chair Lakes) were also identified and are located east of the project area.

During the July 2010 wetland evaluation of the Mulligan Plains East route, narrow-leafed gentian was observed in several wetlands south of the Yellow Dog River and north of Mulligan Creek. Dwarf bilberry has not been found in any of the botanical surveys conducted for the CR 595 or Woodland Road projects and Kirtland's warblers have not been identified in any of the bird surveys conducted by KME in the past in this area. No detailed site evaluation of the Mulligan Cliffs or Rocking Chair Lakes was conducted because these areas are outside of the area of investigation. The Conservation Easement mentions that 12 species of "rare plants" have been identified on the easement property, but there is no mention of any state-listed threatened or endangered species being documented on the property.

- ii. Cost for the engineering and construction of a bridge over the Yellow Dog River gorge.

Response:

Two designs for the construction of a road over the Yellow Dog River gorge on the Mulligan Plains East route were prepared by Coleman Engineering Company (Coleman); a "high bridge" design and a "low bridge" design.

The "high bridge" was designed to minimize the significant amount of earth excavation and rock cut that would be necessary to construct a lower bridge over the river, but significant earth excavation and rock cuts would still be necessary for this type of design. As shown on the spreadsheets in Appendix B, over 1 million cubic yards of earth excavation and 0.5 million cubic yards of rock cut would be required to construct the approaches for the high bridge design.

The “high bridge” alternative for crossing the Mulligan Plains presents major challenges during and after construction of what would be a long, high bridge. The “high bridge” would be 1,200 feet in length, with the deck approximately 240 feet above the Yellow Dog River (which for reference purposes would be about 40 feet higher than the height of the Mackinac Bridge).. Construction of this structure would be very difficult given that multiple spans and therefore multiple piers would be required to extend from the Yellow Dog River elevation up to the proposed bridge. Access to the bottom of the gorge by heavy equipment is very limited, making fabrication and installation of the piers very difficult.

Long-term maintenance costs associated with a structure of this size must also be considered. The long-term maintenance costs of structures are often proportional to their length. A 1,200-foot bridge would result in high maintenance costs realized by MCRC in the future and would involve special costs such as the employment of national bridge inspection engineering firms that would be needed to provide the specialized bi-annual inspection services and certifications necessary to determine that the bridge is properly maintained and safe for traffic. The cost of such structural engineering services would likely be at least four times more cost than local bridge inspectors that inspect smaller bridges; MCRC does not currently employ staff qualified to inspect a structure of this size.

As previously described, the construction cost estimate for the Mulligan Plains East route for the “high bridge” design, including approaches, is \$126 million. The route with the “high bridge” is not prudent due to the high cost of construction and maintenance of this bridge.

The “low bridge” was designed to assess the feasibility of a lower bridge over the same stretch of the Yellow Dog River. As shown on the spreadsheets in Appendix B, nearly 4 million cubic yards of earth excavation and about 2.5 million cubic yards of rock excavation would be required to create the approaches on the deep gorge to reach the elevation of the “low bridge”. The “low bridge” would have a deck height approximately 100 feet above the Yellow Dog River, which is about the same height of the new CR 510 bridge over the Dead River in Marquette County. The construction cost estimate for the Mulligan Plains East route for the “low bridge” design is \$212 million.

The Mulligan Plains East route with the “low bridge” design is not prudent due to the extraordinary cost, which is nearly \$86 million more than the route with the “high bridge” design. There would also be substantial concern with the feasibility of the “low bridge” design in regard to soil erosion control during and after construction, which could impact the Yellow Dog River and with maintaining embankment stability. Vehicle safety negotiating the steep approaches,

especially in winter is also a concern. For these reasons the “low bridge” design has not been further considered by MCRC.

- iii. Overall cost for construction, operation, and maintenance of each of these alternatives, compared to the cost of the proposed CR 595 construction, including the cost of relocating the snowmobile trail (Trail 5). For ease of comparison, these costs should be expressed as a present value. The assumptions used to determine present value should be provided.

Response:

Coleman has prepared quantity and cost estimates for CR 595, the Mulligan Plains West and Mulligan Plains East routes based upon plan and profile drawings that have been prepared for each route. The cost estimates utilized by Coleman contain realistic engineering assumptions. The plan and profile drawings for the Mulligan Plains West and Mulligan Plains East routes are provided in Appendix A and quantity spreadsheets (with cost estimates) for these routes are provided in Appendix B. All costs presented are Net Present Cost (NPC). Trail 5 relocation plans are provided in Appendix A.

The Mulligan Plains West and Mulligan Plains East routes are proposed to cross the Dead River upstream of its confluence with Mulligan Creek. The reasons for proposing the new route for the Mulligan Plains West and Mulligan Plains East alternatives are to avoid impacting the landowners that have modern camps on the Dead River upstream of the AAO bridge with a new road close to their properties and to provide a new bridge over the Dead River that is upstream of the AAO bridge that is designed to be less likely to be impacted by a flood event.

It should be noted that the wetland impacts for the new Dead River to Wolf Lake Road route are based upon National Wetland Inventory (NWI) mapping. Based upon our consultant’s experience with delineation of wetlands in this area, it is known that using NWI underestimates the actual wetland impacts. Wetland delineation will be conducted by April 30, 2012 and the actual wetland impacts of this route segment will be provided to MDEQ by May 4, 2012.

Construction Costs

The construction cost estimate for CR 595 is \$82 million. This cost is based on complete and detailed engineering by Coleman.

The construction cost estimate for the Mulligan Plains West route is \$79 million. This cost is based on complete and detailed engineering by Coleman for much of the route. Assumptions are noted on the spreadsheet in Appendix B.

The construction cost estimate for the Mulligan Plains East route with the “high bridge” design, is \$126 million. The route with the “high bridge” design cost is used due to the extraordinary costs associated with the “low bridge” design. This route design is also based on available Digital Elevation Model topographic information as explained for the Mulligan Plains West route.

The cost for relocation of snowmobile Trail 5 associated with the construction of CR 595 is estimated to be \$700,000. The cost for relocation of Trail 5 associated with the construction of the CR 510/Red Road/Sleepy Hollow route, Mulligan Plains West, and Mulligan Plains East alternatives is estimated to be \$20,000. Both estimate spreadsheets are included in Appendix B.

Table 2-2. Comparison of Construction Cost Estimates and Trail 5 Relocation Costs for CR 595, Mulligan Plains West, and Mulligan Plains East Alternatives.

Alternative Route	Construction Cost	Trail 5 Relocation Cost
CR 595	\$82 million	\$700,000
Mulligan Plains West	\$79 million	\$20,000
Mulligan Plains East	\$126 million	\$20,000

Mining Industry Operating Costs

Operating costs for hauling ore from Eagle Mine to Humboldt Mill on the CR 595, Mulligan Plains West, and Mulligan Plains East routes have been estimated based upon the following assumptions:

- Operating cost per truck mile averages \$4.92 and is based on round trip mileage between mine and mill.
- A “life of mine” (net present value) factor is used for the comparison.
- Operating costs are very closely related to the distance the truck travels between mine and mill.
- Cost per tonne = 42.8 miles x \$4.92 / 40 tonnes per load = \$5.26 per tonne on CR 595, which is used as the basis for these estimates.
- Total cost is based on 3.8 million tonnes, which is the estimated total production currently projected for the Eagle Mine.
- Easement costs may be applicable, but are minor and not considered.
- Total costs are closely related to construction costs in most cases; therefore route comparisons are based on construction costs and operating costs.

A table with Ore Transportation Costs for Project Eagle is provided in Appendix F.

Table 2-2. Operating Cost Factors for Eagle Development Project Hauling on CR 595, Mulligan Plains West and East Routes.

Route	Round Trip Length	Cost/Tonne	Total Trucking NPC
CR 595	42.8 miles	\$5.30	\$20 million
Mulligan Plains West	48 miles	\$5.80	\$22 million
Mulligan Plains East	52.8 miles	\$6.60	\$25 million

Logging Industry Operating Costs

Operating costs for the timber industry for each route should also be comparable for CR 595 and the Mulligan Plains West and East routes; the primary factor influencing cost is the distance of the routes. All three routes begin at the same points; on the north at the Triple A Road/Trail 5 intersection; and, both end at US-41 at CR FY. Overall, the operating costs of the CR 595, Mulligan Plains West, and Mulligan Plains East routes as they relate to the timber industry should be similar.

MCRC Operating Costs

Operating costs (aka maintenance costs) for MCRC are a significant consideration in determining whether a new road route is prudent in the long term. Maintenance of existing roads is already a difficult challenge for MCRC (and other road commissions) due to the reality of diminished funding from State and Federal transportation funding sources. Building a new road that cannot reasonably be maintained makes little economic sense.

Based on Fiscal Year 2011 figures, the average annual cost for MCRC to maintain primary county roads is \$13,452.50 per mile and the average cost to maintain a local road is \$2,760.91 per mile. Table 2-3 provides the maintenance cost comparisons of all four routes. The average cost per mile for primary county road maintenance was multiplied by the number of miles of the routes in Table 2-3. Because CR 595 is the shortest route, it is the least expensive to maintain.

Table 2-3. Comparison of MCRC Maintenance Costs for CR 595 and Other Alternative Routes Evaluated.

Route	Route Length	Annual Maintenance Cost for Primary County Road @ \$13,452.50/Mile	Existing Miles Primary or Local County Road Length	Existing Annual Maintenance Cost @ \$13,452.50/Mile Primary Road \$2,760.91/Mile Local Road	Total Additional Annual Maintenance Cost	Comparison of Total Additional Annual Maintenance Cost to CR 595 Additional Annual Maintenance Cost
CR 595	21.4 miles	\$287,883.50	0 Primary 4.2 Local	\$11,595.82	\$276,287.68	N/A
Mulligan Plains West	24.05 miles	\$323,532.62	0 Primary 5.2 Local	\$14,356.73	\$309,175.89	+\$32,888.21
Mulligan Plains East	25.91 miles	\$348,554.27	0 Primary 5.2 Local	\$14,356.73	\$334,197.54	+\$57,909.86
CR 510/Red Road/Sleepy Hollow	41.3 miles	\$555,588.25	11 mi. Primary 19.9 Local	\$147,977.50 \$54,942.11 Total = \$202,919.60	\$352,668.65	+\$76,380.97

- iv. Cost for compensatory wetland mitigation for the actual wetland acres and types that would be impacted on each of these alternatives, assuming that these impacts would be avoided and minimized to the extent possible. Include a comparison of the cost for compensatory wetland mitigation for the proposed CR 595 route.

Response:

The estimated cost for wetland mitigation is provided in Table 2-4. The quantity spreadsheets prepared by Coleman (Appendix B) provide the cost and other details for mitigation. A per-acre cost of \$50,000 was used in the cost estimates to create wetlands for wetland mitigation.

Table 2-4. Wetland Mitigation Details and Costs for CR 595, Mulligan Plains West and East Alternatives.

Alternative	Wetland Impact (ac)	Total Wetland Mitigation (ac)	Cost of Wetland Mitigation*
CR 595	25.45	48.41	\$2.4 million
Mulligan Plains West	10.29	19.60	\$1 million
Mulligan Plains East	10.39	19.80	\$1 million

*These costs are included in the overall construction cost of this route.

In addition to a description of wetland mitigation, impacts to the natural resources in the lands covered by the Conservation Easement on the Mulligan Plains West route have been considered. Those potential impacts could include removal of old-growth timber, stream crossings, wetland impacts, and aesthetic impacts.

Many of these types of impacts cannot be mitigated in-kind. One possible mitigating measure could be to preserve additional ecologically valuable lands with a Conservation Easement to protect these lands in perpetuity from logging or development. That type of mitigating measure would add to the acreage of protected lands, but it would not necessarily completely mitigate for the impacts to the existing Conservation Easement if a road were built through it.

- v. Comparison of the number of stream crossings on each of these alternative routes with the number of stream crossings on the proposed CR 595 route, including the associated costs of construction of the stream crossings.

Response:

The number of stream crossings for CR 595, Mulligan Plains West, and Mulligan Plains East and the estimated construction costs for these stream crossings are provided in Table 2-5 and in the spreadsheets in Appendix E. The obvious difference in the costs of the Mulligan Plains routes is the need for a large bridge on the Yellow Dog River on the East route.

A revised route for a section of both of the Mulligan Plains alternatives has been evaluated since the AFP was filed. That alternative segment would extend across the Dead River upstream of its confluence with Mulligan Creek, and then extend generally southwest to meet the proposed CR 595 route near Wolf Lake. A crossing of Connors Creek would be required with this revised route segment.

Table 2-5. Stream Crossings on the CR 595, Mulligan Plains West, and Mulligan Plains East Alternatives and Estimated Costs.

Alternative	Stream Crossings	Construction Cost for Stream Crossings for Entire Route*
CR 595	22	\$3.5 million
Mulligan Plains West	18	\$2.7 million
Mulligan Plains East	14	\$18.5 million

*These costs are included in the overall construction cost of this route.

- vi. Anticipated cost of stream mitigation for each of these alternatives, compared to stream mitigation costs for proposed CR 595. Please consider that stream mitigation would likely not be required for bridging the Yellow Dog River gorge.

Response:

The stream mitigation that is proposed for the CR 595 project is the reconstruction of Triple A Road where it crosses the East Branch Salmon Trout River (EBSTR) and replacing the three culvert crossings with one box beam bridge. Because of the importance of the EBSTR restoration project, this stream mitigation project would also be implemented for the Mulligan Plains West and Mulligan Plains East alternatives, even though there are fewer stream crossings on the two Mulligan Plains routes.

A component of the stream mitigation plan was implementation of aspects of the Stream Simulation Methodology to properly determine the size and design the installation of all proposed new or replacement bridges/culverts. The main purpose of the methodology is to minimize impacts of stream crossing structures on the stream bed, stream banks, and aquatic resources. Thus, the substantial amount of field work, surveying, design input, and cost of upsizing structures from the size of structures that currently occur (or otherwise potentially may have been permitted in the past) are all components of the proposed stream mitigation for CR 595. A cost has not been attributed to the implementation of the Stream Simulation portion of the stream mitigation plan.

The cost of the proposed EBSTR stream mitigation project is estimated to be \$1.6 million.

3.0 Conclusions Regarding the Feasibility of the Mulligan Plains West and Mulligan Plains East Alternatives.

As discussed in the preceding parts of this document, the Mulligan Plains West alternative is not feasible or practicable. This alternative would have similar construction and operating costs to CR 595, would have less wetland impact, and fewer stream crossings than CR 595, but is not available because the route is encumbered with a Conservation Easement. It is therefore not a feasible, prudent, or practicable alternative.

The Mulligan Plains East alternative is not prudent due to the extraordinary cost a road of crossing the Yellow Dog River gorge. The total cost of construction (including the least expensive “high bridge” option) for this alternative is \$126 million, which is \$44 million more than the estimated construction costs of CR 595. Notwithstanding the reduced impacts to wetlands and fewer stream crossings, the very high cost makes public or private funding of construction of a road on this route not feasible, prudent, or practicable.

4.0 CR 510-Red Road-Sleepy Hollow Alternative

The applicant’s concerns associated with this alternative are:

- The alternative does not meet the project purpose;
- the alternative is not feasible or prudent.

4.1 MDEQ requested the following information to clarify and amplify the information provided for the CR 510/Red Road/Sleepy Hollow alternative:

- a. Provide a construction and operating cost comparison of this alternative to CR 595, including the relocation of the hairpin curve, stream crossing construction costs, compensatory stream mitigation costs (stream channel areas currently running adjacent and parallel to the road are likely to be improved by proper relocation), and compensatory wetland mitigation costs.

Response:

The analysis and engineering associated with the alignment and design of the CR 510/Red Road/Sleepy Hollow alternative route has been a substantial undertaking and has involved months of field and office work. AECOM initiated some of the field surveying in 2010; Coleman has continued this effort in 2011 and 2012. King & MacGregor Environmental (KME) has provided stream survey assistance, wetland delineation, botanical surveys, and related services to assess this route. Suitable topographic mapping and road centerline survey data had to be obtained to provide the level of analysis needed to properly evaluate this alternative with the Mulligan Plains and CR 595 alternatives.

It is important to note that the recent engineering of the CR 510/Red Road/Sleepy Hollow route determined that the wetland impacts of this route are actually 23.19 acres and not 13.04 acres as estimated in the AFP. The AFP wetland impact estimate of 13.04 acres was based upon very preliminary engineering without topographic information needed to determine the necessary vertical alignment of the road. The more detailed analysis conducted as a result of the March 13, 2012 letter from MDEQ provided an accurate estimate of the wetland impact.

The CR 510/Red Road/Sleepy Hollow alternative route has been revised from the Dead River south in the intervening time between when the AFP was filed and this date. The new route for the CR 510/Red Road/Sleepy Hollow alternative, after the route crosses the AAO bridge over the Dead River going south, goes on a different alignment than the alignment proposed in the AFP (Figure 1). The new alignment will leave CR AAO south of the Dead River and go to the southwest to connect with the new common alignment proposed for the Mulligan Plains West and East routes. This new alignment connects with the proposed CR 595 near Wolf Lake. By having the alignment remain on the existing road over the Dead River on the AAO bridge, the camps that are located on the north side of the Dead River near this location will not be impacted by a new road alignment.

The revised route is 1.6 miles longer than the route presented in the AFP, which continued on CR AAO south to the Sleepy Hollow Road segment and then westerly to Wolf Lake Road. However, wetland and stream impacts are nearly the same for each route. More definite data will be available after the wetland delineation is conducted.

Construction Costs

The construction cost estimate for CR 510/Red Road/Sleepy Hollow is \$126 million. This cost is based on complete and detailed engineering by Coleman comparable to the engineering for CR 595, except as noted on the plan and profile drawings or spreadsheets, and includes the realignment of CR 510 at the hairpin curve, relocation of portions of streams to minimize impacts from the roadway, and improvement of all stream crossings based upon the implementation of the Stream Simulation Methodology to minimize long-term impacts (and enhance existing resource values) on streams. The plan and profile drawings provide details on the road and stream relocations (Appendix A); the stream crossing schedule is provided in Appendix E.

Table 4-1. Comparison of Construction Cost Estimates and Trail 5 Relocation Costs for CR 595 and CR 510/Red Road/Sleepy Hollow Alternatives.

Alternative Route	Construction Cost*	Trail 5 Relocation Cost*
CR 595	\$82 million	\$700,000
CR 510/Red Road/Sleepy Hollow	\$126 million	\$20,000

*These costs are included in the overall construction cost of this route.

Mining Industry Operating Costs

Mining industry operating costs have been estimated using the same assumptions and methods explained in prior sections of this document. The mine-related operating costs for CR 595 and the CR 510/Red Road/Sleepy Hollow routes are compared in Table 4-2.

Table 4-2. Operating Cost Factors for Eagle Development Project Hauling on CR 595 and CR 510/Red Road/Sleepy Hollow Routes.

Route	Round Trip Length*	Cost/Tonne	Total Trucking NPC
CR 595	42.8 miles	\$5.30	\$20 million
CR 510/Red Road/Sleepy Hollow	82.6 miles	\$10.30	\$39 million

MCRC Operating Costs

MCRC average annual maintenance costs for primary county roads in Marquette County have been determined through 2011 to be \$13,452.50 per mile. The maintenance costs for CR 595 and the CR 510/Red Road/Sleepy Hollow routes are compared in Table 4-3.

Table 4-3. Comparison of MCRC Maintenance Costs for CR 595 and CR 510/Red Road/Sleepy Hollow Routes.

Route	Route Length	Annual Maintenance Cost @ \$13,452.50/Mile	Existing Miles Primary or Local County Road Length	Existing Annual Maintenance Cost @ \$13,452.50/Mile Primary Road \$2,760.91/Mile Local Road	Total Additional Annual Maintenance Cost	Comparison of Total Additional Annual Maintenance Cost to CR 595 Additional Annual Maintenance Cost
CR 595	21.4 miles	\$287,883.50	0 Primary 4.2 Local	\$11,595.82	\$276,287.68	N/A
CR 510/Red Road/Sleepy Hollow	41.3 miles	\$555,588.25	11 Primary 19.9 Local	\$147,977.50 \$54,942.11 Total = \$202,919.60	\$352,668.65	+\$76,380.97

Wetland Mitigation

The estimated cost for wetland mitigation is provided in Table 4-4. The quantity spreadsheets prepared by Coleman (Appendix B) provide the cost and other details for mitigation. A per-acre cost of \$50,000 was used in the cost estimates to create wetlands for wetland mitigation.

Table 4-4. Wetland Mitigation Details and Costs for CR 595 and CR 510/Red Road/Sleepy Hollow Alternatives.

Alternative	Wetland Impact	Total Wetland Mitigation	Cost of Wetland Mitigation
CR 595	25.45 acres	48.41 acres	\$2.4 million
CR 510/Red Road/Sleepy Hollow	23.19 acres	46.38 acres	\$2.3 million

- b. Comparison of emergency response time for this route, to that for the proposed CR 595, including response time from/to Marquette General Hospital and Bell Memorial Hospital.

If CR 595 does not exist, emergencies in northwest Marquette County (e.g. fire or accidents) would likely have the initial emergency services response come from Big Bay (20-30 minute response time) and/or Marquette General Hospital via CR 550 to CR 510 to Triple A Road (45-60 minute response time). The CR 510/Red Road/Sleepy Hollow route, if it were constructed, would not be a viable route for fire and EMS response to northwest Marquette County from Marquette because of the long distance that would have to be traveled compared to the CR 550 route. However, if an emergency required additional EMS response from Bell Memorial Hospital in Ishpeming, it may access northwest Marquette County using the CR 510/Red Road/Sleepy Hollow route, but it would likely use CR 550, which would take approximately 90 minutes to respond. In effect, the CR 510/Red Road/Sleepy Hollow route would not benefit emergency services access, with the exception of providing a route for law enforcement personnel to travel to the Big Bay area from the western areas of Marquette County.

In comparison, the CR 595 route is about half the length of the CR 510/Red Road/Sleepy Hollow route and would provide much more timely response for EMS and fire personnel from Ishpeming to Eagle Mine (i.e. Bell Memorial Hospital and DNR fire response), with an estimated response time of 30-45 minutes. Emergency response from Marquette, either fire or EMS, would likely utilize CR 550 and not CR 595, which would have an estimated 60 minutes response time.

The response time for EMS or fire personnel to reach the Triple A Road/CR 595 intersection (as a hypothetical north terminus) from Marquette using CR 550 to CR 510 to Triple A Road (60 minutes) would be a longer response time for EMS or fire personnel reaching the same point from Ishpeming using CR 595 (30-45 minutes). Emergency response from Champion Township would take even less time than from Ishpeming. An important benefit of CR 595 is that it provides a second, reliable access route to northwest Marquette County, which is a critical factor in the event of a life-saving emergency. In a flood emergency, CR 595

provides an access route that is upstream of the Dead River dams and that would be available during a major flood event.

- c. Comparison of the effects of the use of this alternative to the use of proposed CR 595 on the recreational uses of the land area affected by each.

The CR 510/Red Road/Sleepy Hollow route would provide recreational access to more lands due to the route being nearly twice as long as the proposed CR 595. The CR 510/Red Road/Sleepy Hollow route would provide all-season paved access to numerous camps along the north side of the Hoist Basin and to land owners on CR 510 between Red Road and Triple A Road. Other recreationists would also have improved access to lands open to public use along this route.

While there are county roads existing for much of the CR 510/Red Road/Sleepy Hollow route, the CR 595 route has fewer existing roads for the public to access lands open to recreation.

- d. Comparison of the estimated commercial, industrial, and other business benefits of this route to those for the proposed CR 595.

The CR 510/Red Road/Sleepy Hollow route will have substantially less positive impacts on commercial, industrial, and other business benefits than the proposed CR 595. As presented in this response, the construction and operating costs of the CR 510/Red Road/Sleepy Hollow route are significantly higher than the proposed CR 595 (Tables 4-1, 4-2, and 4-3). Construction costs are \$82 million for CR 595 compared to \$126 million for CR 510/Red Road/Sleepy Hollow; KEMC Eagle operating (transportation) costs are \$20 million compared to \$39 million; and MCRC annual maintenance costs are estimated to be \$268,000 more than the proposed CR 595.

For the timber industry, the CR 510/Red Road/Sleepy Hollow route would provide much improved access in portions of northwest Marquette County, but the efficient connection of the northwest part of the county to US-41 provided by the proposed CR 595 would not be provided by the CR 510/Red Road/Sleepy Hollow route. The business benefits to the timber industry would not be substantial if the CR 510/Red Road/Sleepy Hollow route is constructed; much of the logging traffic would likely continue to use CR 550 in that case. The exception would be for logging of lands that are adjacent to the CR 510/Red Road/Sleepy Hollow route, in which case the road would provide business benefits. Access to the extensive acreage of timber lands north of the Yellow Dog River would not be substantially improved by implementation of the CR 510/Red Road/Sleepy Hollow route, since those lands are generally accessible from Triple A Road.

- e. Documentation to indicate whether this route has been evaluated as a potential primary county road by MDOT, and whether it meets the criteria, as determined by MDOT.

Response:

The director of MDOT, Kirk T. Steudle, wrote a letter of finding of necessity for CR 595 stating: "The department supports the MCRC finding that this proposed route is a necessity for providing vital commercial and access improvement benefits for the county." MDOT has agreed with MCRC analysis that CR 595 as proposed is a needed road.

MCRC concluded from its evaluation process that the CR 510/Red Road/Sleepy Hollow alternative does not meet the project purpose and does not fulfill the purpose and need for a new road. MCRC has not asked MDOT to evaluate the CR 510/Red Road/Sleepy Hollow route but MCRC points out that the CR 510/Red Road/Sleepy Hollow route involves a portion of CR 510, which is already a primary county road. The remainder of this alternative route is what is in question in regard to whether MDOT would qualify this route as a primary county road. The standards MDOT uses for county primary roads are provided in Appendix L. If MCRC was required to build the CR 510/Red Road/Sleepy Hollow route it would more than likely qualify to be a primary county road according to MDOT standards.

- f. A comparison of the cumulative impacts to the aquatic resources that would result from the use of this route, to those for the proposed CR 595.

The potential cumulative impacts on aquatic resources that may result from the implementation of the CR 510/Red Road/Sleepy Hollow route have been compared to the CR 595 route as was done for the Mulligan Plains West and Mulligan Plains East routes in section 2.2 of this response. Table 4-5 provides a comparison of potential cumulative impacts to aquatic resources for CR 595 and the CR 510/Red Road/Sleepy Hollow routes.

Table 4-5. Comparison of Cumulative Impacts to Aquatic Resources that may Result from the Implementation of CR 595 and the CR 510/Red Road/Sleepy Hollow Alternatives.

Potential Cumulative Impact	CR 595	CR 510/Red Road/Sleepy Hollow
Secondary development	<p>Secondary development that may result from the construction of CR 595 is not expected to have any substantial effect on aquatic resources (i.e. wetlands or streams). Any secondary development that would affect aquatic resources would likely require a permit from MDEQ. Activities not requiring an MDEQ permit, such as construction of logging roads, are not expected to increase as a result of CR 595. Logging of timber lands is dependent upon the timing of a timber compartment coming up for harvest due to timber growth and economic factors, not on road access.</p> <p>A substantial percentage of the route is through large timber company holdings that have been owned and dedicated to timber production for over 100 years. There is little virgin timber on these lands; timber on most lands has been harvested more than once in past years. Roads and trails already exist on these lands. Most timber lands are in Commercial Forest Act (CFA) devoting the use of the land to timber production. The CFA provides public access. There is no electric power north of Brocky Lake, which limits the size of any development to small camps; these small camps are relatively unobtrusive.</p>	<p>Secondary development on the CR 510/Red Road/Sleepy Hollow route may be more likely than on the CR 595 route due to the land ownership patterns and partial availability of electric power. The most likely area for secondary development that could result from construction of a paved primary county road adjacent to existing private parcels is along the Red Road portion adjacent to Hoist Basin. However, other than the Hoist Basin itself, there are very few wetlands or streams on these properties and cumulative impacts on aquatic resources are not likely to occur.</p> <p>Cumulative impacts from secondary development are unlikely on CR 510 due to the lack of electric power and land ownership patterns. There are some residences and camps existing along this road and the improved access would be a benefit, but is not likely to lead to cumulative impacts to aquatic resources.</p> <p>The Dead River to CR 595 segment of this route is on timber company properties and cumulative impacts from secondary development on this segment are unlikely. Electric power is not available and camps developed on leased land are unlikely to have any impacts on aquatic resources.</p>

Table 4-5 (continued).

Potential Cumulative Impact	CR 595	CR 510/Red Road/Sleepy Hollow
Wildlife mortality	<p>Mortality to wildlife species associated with aquatic resources is likely with any road that crosses wetlands and streams, but the magnitude of impacts to wildlife directly associated with aquatic resources is not likely to be substantial. This could include wildlife using a wetland as a travel corridor or species that are dependent upon living in an aquatic environment. This issue has been addressed in the AFP. The average vehicle speeds on this route are expected to be 45 mph or less. Signage and other measures to reduce wildlife mortality on the roadway may be implemented if found to be necessary.</p>	<p>Cumulative impacts to wildlife species associated with aquatic resources that may result from the implementation of the CR 510/Red Road/Sleepy Hollow route may be more of a concern with this route due to the length of the route (i.e. 41.3 miles compared to 21.4 miles for CR 595). There are portions of the route that are in close proximity to streams and pass through wetlands. Cumulative impacts to aquatic resources in these areas may occur as a result of wildlife mortality due to traffic or from road runoff (i.e. salt or sediment), impacting habitat conditions for fish or amphibians.</p>
Introduction of non-native species of vegetation	<p>Introduction of non-native species of vegetation into a landscape that is dominated by native plant species is a potential cumulative effect of a new road. The vectors for new plant species to be introduced would primarily be by seeds or propagules in soil imported from another area or carried by vehicles and deposited along the roadway. Measures will be implemented to minimize these potential vectors and to monitor plant communities along the roadway, as described in the application for permit, but the potential will exist for introduction of non-native plant species that may affect aquatic resources.</p>	<p>The introduction of non-native species of vegetation into the landscape from the CR 510/Red Road/Sleepy Hollow route is a potential cumulative impact to aquatic resources. The threat of invasive species introduction is most likely during construction from mulch, topsoil, equipment brought in from other areas that may be carrying seeds or propagules of non-native species. However, increased traffic on the new road over time may also provide a vector for introduction of non-native species of vegetation into aquatic resources.</p>

Table 4-5 (continued).

Potential Cumulative Impact	CR 595	CR 510/Red Road/Sleepy Hollow
<p>Road runoff affecting water quality</p>	<p>Cumulative effects of road runoff on aquatic resources would most likely be manifested in stream water quality. As such, the number of stream crossings would increase the opportunity for potential negative effects proportionally. Implementation of BMPs for stormwater runoff management was a diligent consideration in the design of CR 595, with the intent of minimizing the opportunity for cumulative impacts from runoff entering streams. Measures will be implemented to attempt to minimize impacts from runoff, such as special trucks to transport ore and proper maintenance of the roadway,.</p> <p>Runoff into streams from the existing unpaved roads and trails along portions of the proposed CR 595 route is an existing detriment to stream water quality due to sedimentation. CR 595 will be paved with stormwater runoff controls integrated into the road design to minimize the direct introduction of runoff into streams and wetlands. Paving will serve to reduce the effects of runoff entering streams.</p> <p>CR 595 would involve the replacement of 14 undersized or misplaced culverts, thereby improving stream water quality by reduction of sediment loading and stream scour.</p> <p>Another purposeful design factor is the maintenance of existing runoff patterns on the landscape to ensure that wetland hydrology is not altered. Road runoff should have little sediment load by the time it reaches any wetland or stream due to the stormwater control measures implemented, such as riprap outfalls, stable slopes, and not combining flow from large areas that could cause erosive flow velocities.</p>	<p>A similar program of minimizing the cumulative or long-term impacts of road runoff into aquatic resources as was planned for CR 595 would be implemented for the CR 510/Red Road/Sleepy Hollow route. However, the CR 510/Red Road/Sleepy Hollow route has 33 stream crossings compared to 22 for CR 595. Wetland impacts (i.e. lineal feet of wetland crossings) are less on the CR 510/Red Road/Sleepy Hollow route compared to CR 595, so the potential cumulative impacts of road runoff on aquatic resources in wetlands would be reduced compared to CR 595.</p> <p>Most of the CR 510/Red Road/Sleepy Hollow route is on existing unpaved roads, except for some short paved segments over streams. Road runoff and sediment entering the streams that are directly adjacent to lengthy segments of the CR 510/Red Road/Sleepy Hollow route have long-term cumulative impacts on aquatic resources associated with the wetlands and streams affected. The reconstruction of this route would have net positive benefits in reducing the long-term cumulative impacts to aquatic resources that would result from the relocation of stream segments away from the road, implementing a stormwater runoff plan that minimizes direct impacts to aquatic resources, and replacement of existing undersized or misplaced culverts that are having a negative impact on stream resources.</p>

Table 4-5 (continued).

Potential Cumulative Impact	CR 595	CR 510/Red Road/Sleepy Hollow
Air quality	Air quality may be impacted to some extent by the vehicles using CR 595 in the form of engine emissions. The potential for greenhouse gas emissions has been discussed in the AFP in some detail. Deposition of hydrocarbons and other compounds on and adjacent to the roadway from emissions could have deleterious effects on stream water quality. Although there will be a net increase in air emissions after CR 595 is operational compared to present conditions, there is no reason to believe that air quality will have any measurable effect on aquatic resources.	In comparison to CR 595, the CR 510/Red Road/Sleepy Hollow route would have increased potential for greenhouse gas emissions affecting aquatic resources over time due to the route being about twice the length of CR 595. The CR 510/Red Road/Sleepy Hollow route also passes in close proximity to more camps and residences than does CR 595. Cumulative impacts to aquatic resources would most likely be manifested in deposition of hydrocarbons on/adjacent to the roadway and then mobilized by stormwater runoff.
Increased noise from vehicles	Noise levels from vehicles have been addressed in the application for permit and specific site studies were done to gather noise data. If CR 595 is constructed, there is no doubt that noise levels will increase over existing noise levels resulting from increased vehicle use. Camp owners or some recreationists (e.g. hikers, cyclists, or gatherers) may be affected by vehicle noise from CR 595; ATV or snowmobile users are not as likely to be affected by increased noise attributed to CR 595.	Cumulative impacts on aquatic resources from vehicle noise on the CR 510/Red Road/Sleepy Hollow route would be similar to the potential impacts described for CR 595. However, the longer route may result in more traffic due to logistics of mine-related hauling if this route were implemented, which could result in more cumulative impacts associated with traffic noise.
Improved access for recreation	The proposed CR 595 will improve access to portions of Marquette County and therefore provide better opportunities for more people to access thousands of acres of lands open to public use, mostly timber company lands enrolled in the Commercial Forest Act. This cumulative impact of CR 595 may be a positive impact, but some may purport that more people access is a negative impact to aquatic resources. More people recreating in/near wetlands and streams may have negative effects on aquatic resources. Presently most hunters and fishermen access wetlands/streams with ATVs, so better road access is not likely to have substantial effect on access for that form of recreation. Overall, negative impacts to aquatic resources due to improved recreation access should be minimal.	The CR 510/Red Road/Sleepy Hollow route is not as likely to have as great an increase in recreation access as the CR 595 project due to the fact that most of the CR 510/Red Road/Sleepy Hollow route is existing roads. Recreation access, although on unpaved public roads, is presently available. A new paved primary county road would improve recreation access but not substantially expand it. Thus the cumulative impacts to aquatic resources that may result from improved access for recreation is minimal for the CR 510/Red Road/Sleepy Hollow route.

Table 4-5 (continued).

Potential Cumulative Impact	CR 595	CR 510/Red Road/Sleepy Hollow
Future mining development	<p>The implementation of future mining development in northern Marquette County is not primarily dependent upon the presence of CR 595 or any other road access. If additional mineral resources are discovered in this region and they can be extracted and processed in an economic fashion, then mining will likely commence. In other words, CR 595 will not cause more mining to ensue. If mining is proposed in other areas of Marquette County then the presence of CR 595 could result in more economic benefit from the mine by minimizing the need for additional access roads. The cumulative impacts of CR 595 would likely be beneficial in this instance because the access provided by CR 595 to northern Marquette County would likely not have to be duplicated. Upgrades to other existing roads, or construction of new road segments or mining roads, may result from other mining development, but these activities would be necessary to provide mine access regardless of the presence of CR 595.</p> <p>The potential exists for future east-west county roads in northern Marquette County to connect public roads in Baraga County to Marquette County. The cumulative impacts of future roads on aquatic resources are highly speculative and would be controlled by MDEQ permits.</p>	<p>Cumulative impacts on aquatic resources that may result from the construction of the CR 510/Red Road/Sleepy Hollow route in regard to future mining development is highly speculative at this time. Although there is mineral exploration ongoing in northwest Marquette County, the only mine under development is the Eagle Mine. As stated for the CR 595 analysis in the preceding column, the presence of CR 510/Red Road/Sleepy Hollow road will not cause mining to occur. The road is not the cause for mines to be initiated, but instead is a transportation route to serve mining. If the road is present in proximity to a mine, then it will likely be utilized and connector roads may need to be constructed. Again, this is not a potential cumulative impact on aquatic resources that is caused by the road being built; it is a result of an economically important mineral resource being developed.</p>

In its March 13, 2012 letter, MDEQ suggested that additional portions of the CR 595 route may have to be investigated for the presence of threatened or endangered species; i.e. areas that are new/revised route segments from the previously proposed Woodland Road should be evaluated for the presence of threatened or endangered species. MDEQ also suggested that this information be obtained for the other three alternative routes (e.g. CR510/Red Road/Sleepy Hollow and the two Mulligan Plains routes).

The primary reroutes from the previously-submitted Woodland Road project to the currently-proposed CR 595 route are the Wasie reroute, the Kipple Creek reroute, and a portion of the route north of Mulligan Creek to the Yellow Dog River. All of these revised route segments have been investigated in the field to determine whether potential habitat exists for threatened or

endangered species. Botanical surveys have confirmed occurrences of narrow-leaved gentian near Mulligan Creek and the route north of Mulligan Creek to the Yellow Dog River. Potential narrow-leaved gentian habitat exists on the Kipple Creek route segment but there has been no opportunity to conduct a survey within the blooming period on the Kipple Creek route segment. That survey will be conducted in summer 2012. No potential habitat for any other listed plant species was identified on these routes. The Wasie reroute was investigated and there is no potential habitat for listed species on those route segments.

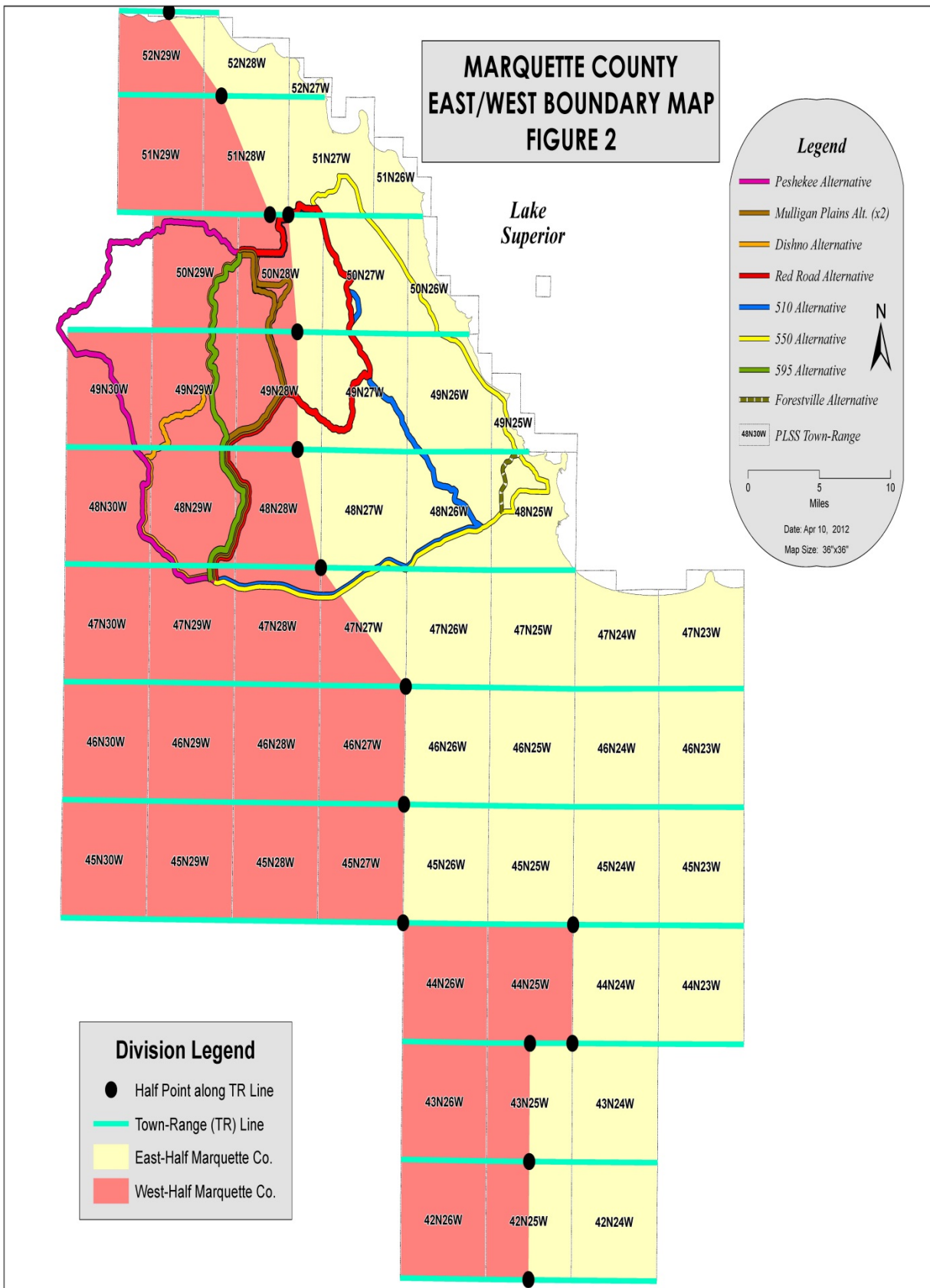
5.0 Conclusions Regarding the Whether the CR 510/Red Road/Sleepy Hollow Route Meets the Project Purpose or is Feasible and Prudent

MCRC finds that the CR 510/Red Road/Sleepy Hollow alternative does not meet the project purpose as stated in the AFP primarily because the route does not substantially improve emergency, commercial, and recreational access to northwest Marquette County. The Triple A Road/CR 510 intersection is located in the east part of Marquette County (Figure 2). The route is 19.9 miles longer than the proposed CR 595 and would require substantial additional expenditures for maintenance of the road, which is not prudent. The cost to construct the CR 510/Red Road/Sleepy Hollow alternative exceeds the cost to construct CR 595 by \$43 million and is therefore not prudent.

Given the information provided in this response, the CR 510/Red Road/Sleepy Hollow route is not a feasible, prudent, or practicable alternative from a cost perspective for either the mining industry or MCRC. This route has only 2.26 acres less wetland impact than CR 595, which is 19.9 miles shorter route than the CR 510/Red Road/Sleepy Hollow route. The difference in wetland impact is not significant given the high comparative costs of the CR 510/Red Road/Sleepy Hollow.

In regard to stream crossings, there are 33 stream crossings on the CR 510/Red Road/Sleepy Hollow route and 22 stream crossings on the CR 595 route. Although many of these stream crossings are considered upgrades or improvements, any stream crossing is likely to have some impacts on the stream. CR 595 has substantially less impact on streams than the CR 510/Red Road/Sleepy Hollow route.

Given the similar wetland impacts of CR 595 and CR 510/Red Road/Sleepy Hollow and the greater stream impacts of the CR 510/Red Road/Sleepy Hollow route, the CR 510/Red Road/Sleepy Hollow route has greater environmental impact when compared to CR 595. In addition, the logistics and cost of the CR 510/Red Road/Sleepy Hollow alternative make this alternative not prudent or practicable.



INFORMATION REQUESTED FOR REVIEW UNDER PART 31

6.0 HEC-RAS analysis of the Middle Branch Escanaba River, Second River, Dead River, Mulligan Creek, Yellow Dog River and East Branch Salmon Trout River

The following sections address the questions posed by MDEQ in regard to the Part 31 aspects of the AFP.

- 5.1 Provide sealed hydraulic reports for all crossings, by licensed Michigan engineer.

Response:

Sealed and signed hydraulic reports are included as attachments to this response (Appendix G).

- 5.2 Clarify the vertical datum used in the models for all crossings.

Response:

The datum used for all the HEC-RAS analyses is Michigan State Plane, North Zone Grid NAD 83, NAVD 88. The datum utilized has been added to each drawing where it is pertinent.

- 5.3 For the proposed crossing of the Middle Branch of the Escanaba River.

- a. The flood damage waiver submitted does not cover all of the properties which will be affected by the increased stages. The flood stage increases extend to station 6538 and the flood damage waiver only covers the properties upstream 1,759 feet. In addition, the flood damage waiver letter states an increase of 0.09 feet, which differs from what is in the engineering report. The affected landowner(s) should be signing off on the correct increase value. Please provide new flood damage waivers with correct flood stage increase data, and which include all property owners within the actual area affected by the increase in flood stage.

Response:

Flood damage waivers have been obtained from two of the affected property owners upstream of the proposed bridge over the Middle Branch Escanaba River (Appendix M). Flood damage waivers have been obtained for A. Lindberg & Sons, Inc. and Holli Forest Products. The waiver from Ron Meyer has not yet been obtained and will be forwarded when the letter is signed.

Once the flood damage waiver is obtained from Ron Meyer, the Hydraulic Report for the Middle Branch Escanaba River will be provided to MDEQ for review.

- b. The recommended structure in the hydraulic report and the structure shown in the profile view drawing differ from what is stated in the application. The recommended structure and the structure shown in the profile view have 4 auxiliary

culverts in the overbank area, differing from the application. Please provide clarification of information provided to ensure that it accurately depicts the proposed activity. Please note that this information will also affect the flood level increases and the above mentioned flood damage waivers.

Response:

The hydraulic report for the Middle Branch Escanaba River shows four (4) 9-foot by 4-foot auxiliary box culverts at this crossing location. These culverts are the same as depicted in the application for permit in the Wetland Equalization Culvert Schedule at Tab 6 of the application. These culverts are also shown on Sheet 1 of the Plan and Profile and Sheets 1A-1D of the Wetland Equalization Culvert Plans.

5.4 For the proposed crossing of Second River.

- a. There is no compensatory floodplain cut proposed. If the Middle Branch Escanaba cut is to be used, this must be clarified. Provide clarification of the proposed compensating cut for the Second River crossing.

Response:

There is no compensatory floodplain cut proposed at the Second River site; compensatory cuts at the Middle Branch Escanaba River compensatory cut site are provided as floodplain mitigation for both the Second River and the Middle Branch Escanaba River crossings (Sheet O and Sheet 1 of the Plan & Profile drawings). Please refer to the revised Floodplain Activities Drawings and Table attached as part of this response (Appendix H).

5.5 For the proposed crossing of the Dead River.

- a. The upstream fill volume (rock riprap) shown on the application drawings does not appear to match the quantity given in the application form. There are discrepancies between the size of proposed bridge stated in the hydraulic report and in the profile plan view submitted with application. Provide clarification of the proposed bridge span (24 or 32-foot span).

Response:

The fill volume (rock riprap) has been adjusted to match the application drawings and the application form. Revised plan & profile drawings (Appendix I) and a revised application for permit form (Appendix J) are attached. The proposed bridge had previously been changed within the application materials and is now depicted as a 24-foot span in all instances.

5.6 For the proposed crossing of the Yellow Dog River.

- a. The application contains discrepancies with the hydraulic report (riprap fill volume and existing bridge size). Provide clarification of the proposed riprap fill volume and the existing bridge size.

Response:

The application for permit (Appendix J) and plan & profile drawings (Appendix I) have been revised to match the rock riprap fill volumes as shown in the hydraulic report for the Yellow Dog River (Appendix G). The existing bridge is depicted as a 40-foot long, 11-foot 8-inch wide structure in the hydraulic report for the Yellow Dog River. This is the correct size; the plan & profile drawings have been revised to match (Appendix I).

5.7 The cross-sections drawn at the upstream and downstream ends of the Yellow Dog river crossing extend through the bridge structure. Provide corrected cross-sections.

Response:

The cross sections are provided in Appendix G in the Yellow Dog River Hydraulic Report.

5.8 For the proposed crossing of the East Branch Salmon Trout River.

- a. The Mannings “n” values selected seem inappropriate for the conditions observed during on-site review. A value of 0.035 for the channel and 0.08 for the overbank areas appears more appropriate. Provide clarified/corrected Mannings values for this crossing.

Response:

The Manning’s values for the channel and overbanks have been adjusted per MDEQ recommendations as shown in the attached revised hydraulic report for the East Branch Salmon Trout River (Appendix G).

- b. Four cross-sections are required for a complete culvert and/or bridge analysis. The cross-sections should be taken at the upstream and downstream faces; one upstream; and one downstream. The upstream/downstream cross-sections should be located outside of the influence of the bridge/culvert and in close proximity to bridge/culvert. Please provide the appropriate cross-sections.

Response:

Additional cross sections were incorporated into the hydraulic model at all culvert and bridge locations as shown in the revised hydraulic report for the East Branch Salmon Trout River (Appendix G).

- c. There is a need for more cross-sections in the model, especially between station 776 and 1128. There is no cross-section between the 2nd and 3rd culverts, which is needed. Coefficients of contraction/expansion should be 0.3 and 0.5 at the crossing locations. Provide the required additional cross-sections, including the corrected coefficients of the referenced contractions/expansion.

Response:

Additional cross sections were incorporated into the hydraulic model for the East Branch Salmon Trout River. Contraction/expansion coefficients of 0.3 and 0.5 are now being used at all crossing locations as shown in the revised hydraulic report for the East Branch Salmon Trout River (Appendix G).

- d. The geometry file shows four culverts, not three, as stated in the application. If there is an extra crossing in the stream model, this must be explained. Cross-section 342 shows a bridge and culvert at the same location, and therefore needs to be clarified. The cross-section does not show fill around the culvert. Provide clarification of the referenced cross-section and indicate if there is both a culvert and a bridge at this crossing, and if there is an existing culvert, the fill associated with it needs to be shown.

Response:

There are three culverts and one bridge-culvert combination. The bridge-culvert combination occurs at station 342 and is an unsupported culvert structure with no fill associated with it and a bridge structure on top of this culvert. Please refer to the photos in the hydraulic report for the East Branch Salmon Trout River for additional clarification of this particular crossing (Appendix G).

- e. The hydraulic report states there are three existing culverts, and the geometry file shows four (4). The application states that there are three existing 30-foot long, 36 to 48-inch diameter culverts. The model shows four culverts varying from 15 to 41 feet in length. Provide clarification of the existing number and lengths of the existing culverts.

Response:

The hydraulic report for the East Branch Salmon Trout River states that three culverts are to be removed. The fourth culvert at station 342 associated with the bridge structure at this location is proposed to remain as is. The culvert lengths are specified in the hydraulic report for the East Branch Salmon Trout River (Appendix G); the existing lengths do not appear elsewhere in the application for permit. The downstream bridge-culvert combination does not affect the hydraulics at the new bridge location.

- f. The distance to the upstream cross-sections for the culverts and/or bridge are depicted as varying from 0.375 feet to 2 feet in the model, which does not reflect what is shown the geometry file. Provide clarification/correction of the distance to the referenced upstream cross-sections.

Response:

The distance to the upstream cross-sections has been verified within the model and geometry files. The model section at the culvert structures is numbered to be at the center of structure, therefore the distance between the upstream section and the

structure section is half the length of the culvert plus the additional distance from the end of the culvert to the upstream section.

- g. The culverts at cross-sections 752 and 1150 are shown to be below the stream invert. This needs to be fixed in the model.

Response:

These culverts have been corrected so they are shown at the stream invert and are shown in the revised hydraulic model for the East Branch Salmon Trout River (Appendix G).

- h. The cross-sections should be checked to make sure they were drawn perpendicular to the stream flow. Provide corrected cross-sections to properly reflect what is occurring at the referenced locations.

Response:

All cross sections were drawn perpendicular to the stream and are shown on the cross section location maps provided in the hydraulic model for the East Branch Salmon Trout River (Appendix G).

- i. When the proposed condition model was run, it was found that the flows and starting conditions had not been input into the Steady Flow input page, and therefore the model would not run. Provide corrected proposed condition model, including the missing flow and starting conditions information.

Response:

The proposed model data has been corrected to include the Steady Flow data and a revised copy of the model for the East Branch Salmon Trout River is provided (Appendix G).

6.0 Conclusions

If there are continuing questions or if the items listed in the March 13, 2012 letter have not been fully addressed in this response, please provide a list of questions or needs for additional information and they will be addressed as soon as possible. In response to the comments presented as part of the public hearing record, those comments have been reviewed and the information provided in the application for permit and this supplemental response is believed to have addressed the questions and concerns expressed by MDEQ.

MCRC appreciates the opportunity to provide clarification of the AFP materials to MDEQ to assist in a full analysis of the AFP and looks forward to this cooperation continuing.

7.0 Appendices

The following Appendices are included on the DVD enclosed with this response.

APPENDIX A

Plan and Profile Drawings for Alternatives

**Mulligan Plains West
Mulligan Plains East
CR 510/Red Road/Sleepy Hollow**

Trail 5 Relocation Plans

APPENDIX B

Quantities and Cost Spreadsheets for:

**CR 595
Mulligan Plains West
Mulligan Plains East
CR 510/Red Road/Sleepy Hollow
Trail 5 Relocation
East Branch Salmon Trout River**

APPENDIX C

January 5, 2012 Letter from The Nature Conservancy

March 22, 2012 Letter from Ronald E. Greenlee

APPENDIX D

**Michigan Natural Features Inventory Data for
Mulligan Plains East and Mulligan Plains West Routes**

APPENDIX E

Stream Crossing Drawings and Schedules for:

**CR 595
Mulligan Plains West
Mulligan Plains East
CR 510/Red Road/Sleepy Hollow**

APPENDIX F

Ore Transportation Costs for Project Eagle

APPENDIX G

Hydraulic Reports (CD)

**Middle Branch Escanaba River
Second River
Dead River
Mulligan Creek
Yellow Dog River
East Branch Salmon Trout River**

APPENDIX H

Revised Floodplain Activities Drawings and Tables

APPENDIX I

Revised Plan & Profile Drawings and Details for CR 595

Wetland Cross Section Summary

Wetland Cross Sections

APPENDIX J

Revised Bridge Plans for CR 595

APPENDIX K

Revised Application for Permit for CR 595

Appendix M

Flood Damage Waivers for the Proposed Middle Branch Escanaba River Bridge

Appendix L

MDOT Primary County Road Standards